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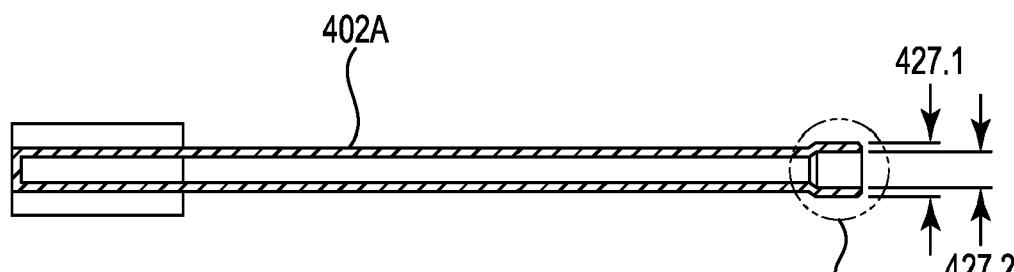
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(54) **TOWERS FOR SUBSTRATE CARRIERS**

(57) A diffuser tower assembly having a diffuser with a flared end and a fitting with an offset portion and nipple sized for the flared end. The assembly may be configured for providing low coverage purging. Diffuser tower assemblies may be in the form of a kit for retrofitting existing front opening wafer containers. The inlet fitting may include structure that enhances purge characteristics near the base of the porous media diffuser for enhanced

sweeping of the floor of the substrate container. Embodiments of the disclosure generate an uneven flow distribution that provides a non-uniform flow distribution at the opening. In an embodiment, where the opening is in a substantially vertical orientation, the non-uniform flow distribution is tailored to deliver a greater flow rate to the bottom half of the opening than to the top of the opening.



**Fig. 21A**

**Fig. 21B**



## EUROPEAN SEARCH REPORT

Application Number

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
10	X US 2012/297981 A1 (BURNS JOHN [US] ET AL) 29 November 2012 (2012-11-29) * abstract; figures 5,8 * * paragraphs [0005], [0033], [0035], [0037] * -----	1-10	INV. H01L21/673 H01L21/67
15	X JP 2010 270823 A (SHINETSU POLYMER CO) 2 December 2010 (2010-12-02) * the whole document * * * -----	1	
20	A US 5 364 007 A (JACOBS STEPHEN W [US] ET AL) 15 November 1994 (1994-11-15) * column 8, line 46 - column 9, line 65; figure 4 * -----	2-10	
25			
30			TECHNICAL FIELDS SEARCHED (IPC)
35			H01L
40			
45			
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The present search report has been drawn up for all claims			
1	Place of search <b>The Hague</b>	Date of completion of the search <b>28 August 2023</b>	Examiner <b>Claessen, Michiel</b>
CATEGORY OF CITED DOCUMENTS			
	X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document	T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document	
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ON EUROPEAN PATENT APPLICATION NO.

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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

28-08-2023

10	Patent document cited in search report	Publication date		Patent family member(s)	Publication date
15	US 2012297981 A1	29-11-2012	CN JP JP KR SG TW US US WO	102812545 A 6057716 B2 2013513951 A 20120107987 A 181595 A1 201136814 A 2012297981 A1 2015348810 A1 2011072260 A2	05-12-2012 11-01-2017 22-04-2013 04-10-2012 30-07-2012 01-11-2011 29-11-2012 03-12-2015 16-06-2011
20	JP 2010270823 A	02-12-2010	JP JP	5241607 B2 2010270823 A	17-07-2013 02-12-2010
25	US 5364007 A	15-11-1994	GB MY SG US	2282871 A 112409 A 82516 A1 5364007 A	19-04-1995 30-06-2001 21-08-2001 15-11-1994
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35					
40					
45					
50					
55					

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82